

# MINIMUM IN-SERVICE EYESIGHT STANDARDS

Table B-1/9

STCW Convention Regulation	Category of seafarer	Distance		Vision*		Near/immediate vision		Colour vision	Visual fields	Night blindness	Diplopia (double vision)
		one eye	other eye	other eye	other eye	Both eyes together	Aided or unaided				
I/11 II/1 II/2 II/3 II/4	Masters, deck officers and ratings required to undertake look-out duties					Vision required for ships' navigation (e.g. chart and nautical publication reference, use of bridge instrumentation and equipment, and identification of aids to navigation)			Normal visual fields	Vision required to perform all necessary functions in darkness without compromise	No significant condition evident
	Aided: Unaided:	0.5" 0.1	0.5 0.1								
I/11 III/1 III/2 III/3 III/4	All engineer officers and ratings forming part of an engine- room watch					Vision required to read instruments in close proximity, to operate equipment, and to identify systems/components as necessary			Sufficient visual fields	Vision required to perform all necessary functions in darkness without compromise	No significant condition evident
	Aided: Unaided:	0.4 0.1	0.4 0.1								
I/11 IV/2	Radio officers and electrical/ electronic officers:					Vision required to read instruments in close proximity, to operate equipment, and to identify systems/components as necessary			Sufficient visual fields	Vision required to perform all necessary functions in darkness without compromise	No significant condition evident
	Aided: Unaided:	0.4 0.1	0.4 0.1								

\*Note: Values given in Snellen decimal notation

\*\*Note: A value of at least 0.7 in one eye is recommended to reduce the risk of undetected underlying eye disease

#### **Section B-I/10**

##### **Guidance regarding the recognition of certificates**

(No provisions)

#### **Section B-I/11**

##### **Guidance regarding the revalidation of certificates**

The courses required by regulation I/11 should include relevant changes in marine technology and recommendations concerning the safety of life at sea and the protection of the marine environment.

#### **Section B-I/12**

##### **Guidance regarding the use of simulators**

1 When simulators are being used for training or assessment of competency, the following guidelines should be taken into consideration in conducting any such training or assessment.

##### **Training and assessment in radar observation and plotting**

2 Training and assessment in radar observation and plotting should:

- .1 incorporate the use of radar simulation equipment; and
- .2 conform to standards not inferior to those given in paragraphs 3 to 17 below.

3 Demonstrations of and practice in radar observation should be undertaken where appropriate on live marine radar equipment, including the use of simulators. Plotting exercises should preferably be undertaken in real time, in order to increase trainees' awareness of the hazards of the improper use of radar data and improve their plotting techniques to a standard of radar plotting commensurate with that necessary for the safe execution of collision avoidance manoeuvring under actual seagoing conditions.

##### **Theory factors affecting performance and accuracy**

4 An elementary understanding should be attained of the principles of radar, together with a full practical knowledge of:

- .1 range and bearing measurement, characteristics of the radar set which determine the quality of the radar display, radar antennae, polar diagrams, the effects of power radiated in directions outside the main beam, a non-technical description of the radar system including variations in the features encountered in different types of radar set, performance monitors and equipment factors which affect maximum and minimum detection ranges and accuracy of information;
- .2 the current marine radar performance specification adopted by the Organization;

- .3 the effects of the siting of the radar antenna, shadow sectors and arcs of reduced sensitivity, false echoes, effects of antenna height on detection ranges and of siting radar units and storing spares near magnetic compasses, including magnetic safe distances; and
- .4 radiation hazards and safety precautions to be taken in the vicinity of antenna and open wave guides.

#### Detection of misrepresentation of information, including false echoes and sea returns

5 A knowledge of the limitations to target detection is essential, to enable the observer to estimate the dangers of failure to detect targets. The following factors should be emphasized:

- .1 performance standard of the equipment;
- .2 brilliance, gain and video processor control settings;
- .3 radar horizon;
- .4 size, shape, aspect and composition of targets;
- .5 effects of the motion of the ship in a seaway;
- .6 propagation conditions;
- .7 meteorological conditions; sea clutter and rain clutter;
- .8 anti-clutter control settings;
- .9 shadow sectors; and
- .10 radar-to-radar interference.

6 A knowledge should be attained of factors which might lead to faulty interpretation, including false echoes, effects of nearby pylons and large structures, effects of power lines crossing rivers and estuaries, echoes from distant targets occurring on second or later traces.

7 A knowledge should be attained of aids to interpretation, including corner reflectors and radar beacons; detection and recognition of land targets; the effects of topographical features; effects of pulse length and beam width; radar conspicuous and inconspicuous targets; factors which affect the echo strength from targets.

### PRACTICE

#### Setting up and maintaining displays

8 A knowledge should be attained of:

- .1 the various types of radar display mode; unstabilized ship's-head-up relative motion; ship's-head-up course-up and north-up stabilized relative motion and true motion;
- .2 the effects of errors on the accuracy of information displayed; effects of transmitting compass errors on stabilized and true motion displays; effects of transmitting log errors on a true motion display; and the effects of inaccurate manual speed settings on a true motion display;
- .3 methods of detecting inaccurate speed settings on true motion controls; the effects of receiver noise limiting ability to display weak echo returns, and the effects of saturation by receiver noise, etc.; the adjustment of operational controls; criteria which indicate optimum points of adjustment; the importance of proper adjustment sequence, and the effects of maladjusted controls; the detection of maladjustments and corrections of:

- .3.1 controls affecting detection ranges, and
- .3.2 controls affecting accuracy;
- .4 the dangers of using radar equipment with maladjusted controls; and
- .5 the need for frequent regular checking of performance, and the relationship of the performance indicator to the range performance of the radar set.

#### **Range and bearing**

- 9 A knowledge should be attained of:
  - .1 the methods of measuring ranges; fixed range markers and variable range markers;
  - .2 the accuracy of each method and the relative accuracy of the different methods;
  - .3 how range data are displayed; ranges at stated intervals, digital counter and graduated scale;
  - .4 the methods of measuring bearings; rotatable cursor on transparent disc covering the display, electronic bearing cursor and other methods;
  - .5 bearing accuracy and inaccuracies caused by: parallax, heading marker displacement, centre maladjustment;
  - .6 how bearing data are displayed; graduated scale and digital counter; and
  - .7 the need for regular checking of the accuracy of ranges and bearings, methods of checking for inaccuracies and correcting or allowing for inaccuracies.

#### **Plotting techniques and relative motion concepts**

10 Practice should be provided in manual plotting techniques, including the use of reflection plotters, with the objective of establishing a thorough understanding of the interrelated motion between own ship and other ships, including the effects of manoeuvring to avoid collision. At the preliminary stages of this training, simple plotting exercises should be designed to establish a sound appreciation of plotting geometry and relative motion concepts. The degree of complexity of exercises should increase throughout the training course until the trainee has mastered all aspects of the subject. Competence can best be enhanced by exposing the trainee to real-time exercises performed on a simulator or using other effective means.

#### **Identification of critical echoes**

- 11 A thorough understanding should be attained of:
  - .1 position fixing by radar from land targets and sea marks;
  - .2 the accuracy of position fixing by ranges and by bearings;

- .3 the importance of cross-checking the accuracy of radar against other navigational aids; and
- .4 the value of recording ranges and bearings at frequent, regular intervals when using radar as an aid to collision avoidance.

**Course and speed of other ships**

12 A thorough understanding should be attained of:

- .1 the different methods by which course and speed of other ships can be obtained from recorded ranges and bearings including:
  - .1.1 the unstabilized relative plot,
  - .1.2 the stabilized relative plot, and
  - .1.3 the true plot; and
- .2 the relationship between visual and radar observations, including detail and the accuracy of estimates of course and speed of other ships, and the detection of changes in movements of other ships.

**Time and distance of closest approach of crossing, meeting or overtaking ships**

13 A thorough understanding should be attained of:

- .1 the use of recorded data to obtain:
  - .1.1 measurement of closest approach distance and bearing, and
  - .1.2 time to closest approach, and
- .2 the importance of frequent, regular observations.

**Detecting course and speed changes of other ships**

14 A thorough understanding should be attained of:

- .1 the effects of changes of course and/or speed by other ships on their tracks across the display;
- .2 the delay between change of course or speed and detection of that change; and
- .3 the hazards of small changes as compared with substantial changes of course or speed in relation to rate and accuracy of detection.

**Effects of changes in own ship's course or speed or both**

15 A thorough understanding of the effects on a relative motion display of own ship's movements, and the effects of other ships' movements and the advantages of compass stabilization of a relative display.

16 In respect of true motion displays, a thorough understanding should be attained of:

- .1 the effects of inaccuracies of:
  - .1.1 speed and course settings, and
  - .1.2 of compass stabilization data driving a stabilized relative motion display;
- .2 the effects of changes in course or speed or both by own ship on tracks of other ships on the display; and
- .3 the relationship of speed to frequency of observations.

**Application of the International Regulations for Preventing Collisions at Sea**

17 A thorough understanding should be attained of the relationship of the International Regulations for Preventing Collisions at Sea to the use of radar, including:

- .1 action to avoid collision, dangers of assumptions made on inadequate information and the hazards of small alterations of course or speed;
- .2 the advantages of safe speed when using radar to avoid collision;
- .3 the relationship of speed to closest approach distance and time and to the manoeuvring characteristics of various types of ships;
- .4 the importance of radar observation reports and radar reporting procedures being well defined;
- .5 the use of radar in clear weather, to obtain an appreciation of its capabilities and limitations, compare radar and visual observations and obtain an assessment of the relative accuracy of information;
- .6 the need for early use of radar in clear weather at night and when there are indications that visibility may deteriorate;
- .7 comparison of features displayed by radar with charted features; and
- .8 comparison of the effects of differences between range scales.

**Training and assessment in the operational use of automatic radar plotting aids (ARPA)**

18 Training and assessment in the operational use of automatic radar plotting aids (ARPA) should:

- .1 require prior completion of the training in radar observation and plotting or combine that training with the training given in paragraphs 19 to 36 below;
- .2 incorporate the use of ARPA simulation equipment; and
- .3 conform to standards not inferior to those given in paragraphs 19 to 36 below.

19 Where ARPA training is provided as part of the general training under the 1978 STCW Convention, masters, chief mates and officers in charge of a navigational watch should understand the factors involved in decision-making based on the information supplied by ARPA in association with other navigational data inputs, having a similar appreciation of the operational aspects and of system errors of modern electronic navigational systems. This training should be progressive in nature, commensurate with the responsibilities of the individual and the certificates issued by Parties under the 1978 STCW Convention.

**Theory and Demonstration**

**Possible risks of over-reliance on ARPA**

20 Appreciation that ARPA is only a navigational aid and:

- .1 that its limitations, including those of its sensors, make over-reliance on ARPA dangerous, in particular for keeping a look-out; and
- .2 the need to observe at all times the Principles to be observed in keeping a navigational watch and the Guidance on keeping a navigational watch.

**Principal types of ARPA systems and their display characteristics**

21 Knowledge of the principal types of ARPA systems in use; their various display characteristics and an understanding of when to use ground or sea stabilized modes and north-up, course-up or head-up presentations.

**IMO performance standards for ARPA**

22 An appreciation of the IMO performance standards for ARPA, in particular the standards relating to accuracy.

**Factors affecting system performance and accuracy**

23 Knowledge of ARPA sensor input performance parameters - radar, compass and speed inputs and the effects of sensor malfunction on the accuracy of ARPA data.

24 Knowledge of:

- .1 the effects of the limitations of radar range and bearing discrimination and accuracy and the limitations of compass and speed input accuracies on the accuracy of ARPA data; and
- .2 factors which influence vector accuracy.

**Tracking capabilities and limitations**

25 Knowledge of:

- .1 the criteria for the selection of targets by automatic acquisition;
- .2 the factors leading to the correct choice of targets for manual acquisition;
- .3 the effects on tracking of "lost" targets and target fading;
- .4 the circumstances causing "target swap" and its effects on displayed data.

**Processing delays**

26 Knowledge of the delays inherent in the display of processed ARPA information, particularly on acquisition and re-acquisition or when a tracked target manoeuvres.

**Operational warnings, their benefits and limitations**

27 Appreciation of the uses, benefits and limitations of ARPA operational warnings and their correct setting, where applicable, to avoid spurious interference.

**System operational tests**

28 Knowledge of:

- .1 methods of testing for malfunctions of ARPA systems including functional self-testing; and
- .2 precautions to be taken after a malfunction occurs.

**Manual and automatic acquisition of targets and their respective limitations**

29 Knowledge of the limits imposed on both types of acquisition in multi-target scenarios, and the effects on acquisition of target fading and target swap.



**True and relative vectors and typical graphic representation of target information and danger areas**

30 Thorough knowledge of true and relative vectors; derivation of targets' true courses and speeds including:

- .1 threat assessment, derivation of predicted closest point of approach and predicted time to closest point of approach from forward extrapolation of vectors, the use of graphic representation of danger areas;
- .2 the effects of alterations of course and/or speed of own ship and/or targets on predicted closest point of approach and predicted time to closest point of approach and danger areas;
- .3 the effects of incorrect vectors and danger areas; and
- .4 the benefit of switching between true and relative vectors.

**Information on past position of targets being tracked**

31 Knowledge of the derivation of past positions of targets being tracked, recognition of historic data as a means of indicating recent manoeuvring of targets and as a method of checking the validity of the ARPA's tracking.

**Practice**

**Setting up and maintaining displays**

32 Ability to demonstrate:

- .1 the correct starting procedure to obtain the optimum display of ARPA information;
- .2 the selection of display presentation; stabilized relative motion displays and true motion displays;
- .3 the correct adjustment of all variable radar display controls for optimum display of data;
- .4 the selection, as appropriate, of required speed input to ARPA;
- .5 the selection of ARPA plotting controls, manual/automatic acquisition, vector/graphic display of data;
- .6 the selection of the time scale of vectors/graphics;
- .7 the use of exclusion areas when automatic acquisition is employed by ARPA; and
- .8 performance checks of radar, compass, speed input sensors and ARPA.

#### **System operational tests**

33 Ability to perform system checks and determine data accuracy of ARPA, including the trial manoeuvre facility, by checking against basic radar plot.

#### **Obtaining information from the ARPA display**

34 Demonstrate the ability to obtain information in both relative and true motion modes of display, including:

- .1 the identification of critical echoes;
- .2 the speed and direction of target's relative movement;
- .3 the time to, and predicted range at, target's closest point of approach;
- .4 the courses and speeds of targets;
- .5 detecting course and speed changes of targets and the limitations of such information;
- .6 the effect of changes in own ship's course or speed or both; and
- .7 the operation of the trial manoeuvre facility.

#### **Application of the International Regulations for Preventing Collisions at Sea**

35 Analysis of potential collision situations from displayed information, determination and execution of action to avoid close-quarters situations in accordance with the International Regulations for Preventing Collisions at Sea in force.

#### **Recommended performance standards for non-mandatory types of simulation**

36 Performance standards for non-mandatory simulation equipment used for training and/or assessment of competence or demonstration of skills are set out hereunder. Such forms of simulation include, but are not limited to, the following types:

- .1 navigation and watchkeeping;
- .2 shiphandling and manoeuvring;
- .3 cargo handling and stowage;
- .4 radiocommunications; and
- .5 main and auxiliary machinery operation

#### **Navigation and watchkeeping simulation**

37 Navigation and watchkeeping simulation equipment should, in addition to meeting all applicable performance standards set out in section A-I/12, be capable of simulating navigational equipment and bridge operational controls which meet all applicable performance standards adopted by the Organization, incorporate facilities to generate soundings and:

- .1 create a real-time operating environment, including navigation control and communications instruments and equipment appropriate to the navigation and watchkeeping tasks to be carried out and the manoeuvring skills to be assessed;
- .2 provide a realistic visual scenario by day or by night, including variable visibility, or by night only as seen from the bridge, with a minimum horizontal field of view available to the trainee in viewing sectors appropriate to the navigation and watchkeeping tasks and objectives; and
- .3 realistically simulate 'own ship' dynamics in open water conditions including the effects of weather, tidal stream, currents and interaction with other ships.

#### **Ship handling and manoeuvring simulation**

38 In addition to meeting the performance standards set out in paragraph 37, ship handling simulation equipment should:

- .1 provide a realistic visual scenario as seen from the bridge by day and by night with variable visibility throughout a minimum horizontal field of view available to the trainee in viewing sectors appropriate to the shiphandling and manoeuvring training tasks and objectives; and
- .2 realistically simulate 'own ship' dynamics in restricted waterways, including shallow water and bank effects.

39 Manned scale models are used to provide shiphandling and manoeuvring simulation, in addition to the performance standards set out in paragraphs 37.3 and 38.2, such equipment should:

- .1 incorporate scaling factors which present accurately the dimensions, areas, volume and displacement, speed, time and rate of turn of a real ship; and
- .2 incorporate controls for the rudder and engines to the correct time scale.

#### **Cargo handling and stowage simulation**

40 Cargo handling simulation equipment should be capable of simulating cargo handling and control equipment which meets all applicable performance standards adopted by the Organization, and incorporate facilities to:

- .1 create an effective operational environment, including a cargo-control station with such instrumentation as may be appropriate to the particular type of cargo system modelled;
- .2 model loading and unloading functions and stability and stress data appropriate to the cargo handling tasks to be carried out and the skills to be assessed; and
- .3 simulate loading, unloading, ballasting and deballasting operations and appropriate associated calculations for stability, trim, list, longitudinal strength, torsional stress and damage stability.

#### **GMDSS communication simulation**

41 GMDSS communication simulation equipment should be capable of simulating GMDSS communication equipment which meets all applicable performance standards adopted by the Organization, and incorporate facilities to:

- .1 simulate the operation of VHF, VHF-DSC, NAVTEX, EPIRB and watch receiver equipment as required for the Restricted Operators Certificate (ROC);
- .2 simulate the operation of INMARSAT-A, B and C ship earth stations, MF/HF NBDP, MF/HF-DSC, VHF, VHF-DSC, NAVTEX, EPIRB and watch receiver equipment as required for the General Operator's Certificate (GOC);
- .3 provide voice communication with background noise;
- .4 provide a printed text communication facility; and
- .5 create a real-time operating environment, consisting of an integrated system, incorporating at least one instructor/assessor station and at least two GMDSS ship or shore stations.

#### **Main and auxiliary machinery operation simulation**

42 Engine-room simulation equipment should be capable of simulating a main and auxiliary machinery system and incorporate facilities to:

- .1 create a real-time environment for seagoing and harbour operations with communication devices and simulation of appropriate main and auxiliary propulsion machinery equipment and control panels;
- .2 simulate relevant sub-systems that should include but not be restricted to boiler, steering gear, electrical power general and distribution systems including emergency power supplies and fuel, cooling water, refrigeration, bilge and ballast systems;
- .3 monitor and evaluate engine performance and remote sensing systems;
- .4 simulate machinery malfunctions;
- .5 allow for the variable external conditions to be changed so as to influence the simulated operations: weather, ship's draught, sea water and air temperatures;
- .6 allow for instructor controlled external conditions to be changed: deck steam, accommodation steam, deck air, ice conditions, deck cranes, heavy power, bow thrust, ship load;
- .7 allow for instructor controlled simulator dynamics to be changed: emergency run, process responses, ship responses; and

- .8 provide a facility to isolate certain processes, such as speed, electrical system, diesel oil system, lubricating oil system, heavy oil system, seawater system, steam system, exhaust boiler and turbo generator for performing specific training tasks.

#### **Section B-I/13**

##### **Guidance regarding the conduct of trials**

(No provisions)

#### **Section B-I/14**

##### **Guidance regarding responsibilities of companies and recommended responsibilities of masters and crew members**

###### **Companies**

- 1 Companies should provide ship specific introductory programmes aimed at assisting newly employed seafarers to familiarize themselves with all procedures and equipment relating to their areas of responsibility.

###### **Master**

- 2 The master should take all steps necessary to implement any company instructions issued in accordance with section A-I/14. Such steps should include:
  - .1 identifying all seafarers who are newly employed on board the ship before they are assigned to any duties;
  - .2 providing the opportunity for all newly arrived seafarers to:
    - .2.1 visit the spaces in which their primary duties will be performed,
    - .2.2 get acquainted with the location, controls and display features of equipment they will be operating or using,
    - .2.3 activate the equipment when possible and perform functions using the controls on the equipment, and
    - .2.4 observe and ask questions of someone who is already familiar with the equipment, procedures and other arrangements, and who can communicate information in a language which the seafarer understands; and
  - .3 providing for a suitable period of supervision when there is any doubt that a newly employed seafarer is familiar with the shipboard equipment, operating procedures and other arrangements needed for the proper performance of his or her duties.

### **Crew members**

3 Seafarers who are newly assigned to a ship should take full advantage of every opportunity provided to become familiar with the shipboard equipment, operating procedures and other arrangements needed for the proper performance of their duties. Immediately upon arriving on board for the first time, each seafarer has the responsibility to become acquainted with the ship's working environment, particularly with respect to new or unfamiliar equipment, procedures or arrangements.

4 Seafarers who do not promptly attain the level of familiarity required for performing their duties have the obligation to bring this fact to the attention of their supervisor or to the attention of the crew member designated in accordance with section A-I/14, paragraph 2.2, and to identify any equipment, procedure or arrangement which remains unfamiliar.

### **Section B-I/15**

#### **Guidance regarding transitional provisions**

(No provisions)

## **CHAPTER II**

### **GUIDANCE REGARDING THE MASTER AND THE DECK DEPARTMENT**

#### **Section B-II/1**

#### **Guidance regarding the certification of officers in charge of a navigational watch on ships of 500 gross tonnage or more**

##### **Training**

1 Every candidate for certification as officer in charge of a navigational watch should have completed a planned and structured programme of training designed to assist a prospective officer to achieve the standard of competence in accordance with table A-II/1.

2 The structure of the programme of training should be set out in a training plan which clearly expresses for all parties involved the objectives of each stage of training on board and ashore. It is important that the prospective officer, tutors, ships' staff and company personnel are clear about the competences which are to be achieved at the end of the programme and how they are to be achieved through a combination of education, training and practical experience on board and ashore.

3 The mandatory periods of seagoing service are of prime importance in learning the job of being a ship's officer and in achieving the overall standard of competence required. Properly planned and structured, the periods of seagoing service will enable prospective officers to acquire and practise skills and will offer opportunities for competences achieved to be demonstrated and assessed.

4 Where the seagoing service forms part of an approved training programme, the following principles should be observed:

.1 The programme of on-board training should be an integral part of the overall training plan.

- .2 The programme of on-board training should be managed and co-ordinated by the company which manages the ship on which the seagoing service is to be performed.
- .3 The prospective officer should be provided with a training record book to enable a comprehensive record of practical training and experience at sea to be maintained. The training record book should be laid out in such a way that it can provide detailed information about the tasks and duties which should be undertaken and the progress towards their completion. Duly completed, the record book will provide unique evidence that a structured programme of on-board training has been completed which can be taken into account in the process of evaluating competence for the issue of a certificate.
- .4 At all times, the prospective officer should be aware of two identifiable individuals who are immediately responsible for the management of the programme of on-board training. The first of these is a qualified seagoing officer, referred to as the shipboard training officer who, under the authority of the master, should organise and supervise the programme of training for the duration of each voyage. The second should be a person nominated by the company, referred to as the company training officer, who should have an overall responsibility for the training programme and for co-ordination with colleges and training institutions.
- .5 The company should ensure that appropriate periods are set aside for completion of the programme of on-board training within the normal operational requirements of the ship.

#### ROLES AND RESPONSIBILITIES

5 The following section summarises the roles and responsibilities of those individuals involved in organizing and conducting on-board training:

- .1 The company training officer should be responsible for:
  - .1.1 overall administration of the programme of training,
  - .1.2 monitoring the progress of the prospective officer throughout, and
  - .1.3 issuing guidance as required and ensuring that all concerned with the training programme play their parts.
- .2 The shipboard training officer should be responsible for:
  - .2.1 organizing the programme of practical training at sea,
  - .2.2 ensuring in a supervisory capacity that the training record book is properly maintained and that all other requirements are fulfilled, and
  - .2.3 making sure, so far as is practicable, that the time the prospective officer spends on board is as useful as possible in terms of training and experience, and is consistent with the objectives of the training programme, the progress of training and the operational constraints of the ship.
- .3 The master's responsibilities should be to:

- .3.1 provide the link between the shipboard training officer and the company training officer ashore,
- .3.2 fulfil the role of continuity if the shipboard training officer is relieved during the voyage, and
- .3.3 ensure that all concerned are effectively carrying out the on-board training programme.
- .4 The prospective officer's responsibilities should be to:
  - .4.1 follow diligently the programme of training as laid down,
  - .4.2 make the most of the opportunities presented, be they in or outside working hours, and
  - .4.3 keep the training record book up to date and ensure that it is available at all times for scrutiny.

#### INDUCTION

6 At the beginning of the programme and at the start of each voyage on a different ship, prospective officers should be given full information and guidance as to what is expected of them and how the training programme is to be organized. Induction presents the opportunity to brief prospective officers about important aspects of the tasks they will be undertaking, with particular regard to safe working practices and protection of the marine environment.

#### SHIPBOARD PROGRAMME OF TRAINING

7 The training record book should contain, amongst other things, a number of training tasks or duties which should be undertaken as part of the approved programme of on-board training. Such tasks and duties should relate to at least the following areas:

- .1 steering systems;
- .2 general seamanship;
- .3 mooring, anchoring and port operations;
- .4 life-saving and fire-fighting appliances;
- .5 systems and equipment;
- .6 cargo work;
- .7 bridge work and watchkeeping; and
- .8 engine-room familiarization.



8 It is extremely important that the prospective officer is given adequate opportunity for supervised bridge watchkeeping experience, particularly in the later stages of the on-board training programme.

9 The performance of the prospective officers in each of the tasks and duties itemized in the training record book should be initialled by a qualified officer when, in the opinion of the officer concerned, a prospective officer has achieved a satisfactory standard of proficiency. It is important to appreciate that a prospective officer may need to demonstrate ability on several occasions before a qualified officer is confident that a satisfactory standard has been achieved.

#### MONITORING AND REVIEWING

10 Guidance and reviewing are essential to ensure that prospective officers are fully aware of the progress they are making and to enable them to join in decisions about their future programme. To be effective, reviews should be linked to information gained through the training record book and other sources as appropriate. The training record book should be scrutinized and endorsed formally by the master and the shipboard training officer at the beginning, during and at the end of each voyage. The training record book should also be examined and endorsed by the company training officer between voyages.

#### ASSESSMENT OF ABILITIES AND SKILLS IN NAVIGATIONAL WATCHKEEPING

11 A candidate for certification who is required to have received special training and assessment of abilities and skills in navigational watchkeeping duties should be required to provide evidence, through demonstration either on a simulator or on board ship as part of an approved programme of shipboard training, that the skills and ability to perform as officer in charge of a navigational watch in at least the following areas have been acquired, namely to:

- .1 prepare for and conduct a passage, including:
  - .1.1 interpreting and applying information obtained from charts,
  - .1.2 fixing position in coastal waters,
  - .1.3 applying basic information obtained from tide tables and other navigational publications,
  - .1.4 checking and operating bridge equipment,
  - .1.5 checking magnetic and gyro-compasses,
  - .1.6 assessing available meteorological information,
  - .1.7 using celestial bodies to fix position,
  - .1.8 determining the compass error by celestial and terrestrial means, and
  - .1.9 performing calculations for sailings of up to 24 hours;

- .2 operate and apply information obtained from electronic navigation systems;
  - .3 operate radar and ARPA and apply radar information for navigation and collision avoidance;
  - .4 operate propulsion and steering systems to control heading and speed;
  - .5 implement navigational watch routines and procedures;
  - .6 implement the manoeuvres required for rescue of persons overboard;
  - .7 initiate action to be taken in the event of an imminent emergency situation (e.g. fire, collision, stranding) and action in the immediate aftermath of an emergency;
  - .8 initiate action to be taken in event of malfunction or failure of major items of equipment or plant (e.g. steering gear, power, navigation systems);
  - .9 conduct radiocommunications and visual and sound signalling in normal and emergency situations; and
  - .10 monitor and operate safety and alarm systems including internal communications.
- 12 Assessment of abilities and skills in navigational watchkeeping should:
- .1 be made against the criteria for evaluating competence for the function of navigation set out in table A-II/1;
  - .2 ensure that the candidate performs navigational watchkeeping duties in accordance with the Principles to be observed in keeping a safe navigational watch (section A-VIII/2, part 3-1) and the Guidance on keeping a navigational watch (section B-VIII/2, part 3-1).

#### EVALUATION OF COMPETENCE

13 The standard of competence to be achieved for certification as officer in charge of a navigational watch is set out in table A-II/1. The standard specifies the knowledge and skill required and the application of that knowledge and skill to the standard of performance required on board ship.

14 Scope of knowledge is implicit in the concept of competence. Assessment of competence should, therefore, encompass more than the immediate technical requirements of the job, the skills and tasks to be performed, and should reflect the broader aspects needed to meet the full expectations of competent performance as a ships' officer. This includes relevant knowledge, theory, principles and cognitive skills which, to varying degrees, underpin all levels of competence. It also encompasses proficiency in what to do, how and when to do it, and why it should be done. Properly applied, this will help to ensure that a candidate can:

- .1 work competently in different ships and across a range of circumstances;

- .2 anticipate, prepare for and deal with contingencies; and
- .3 adapt to new and changing requirements.

15 The criteria for evaluating competence (column 4 of table A-II/1) identify, primarily in outcome terms, the essential aspects of competent performance. They are expressed so that assessment of a candidate's performance can be made against them and should be adequately documented in the training record book.

16 Evaluation of competence is the process of:

- .1 collecting sufficient valid and reliable evidence about the candidate's knowledge, understanding and proficiency to accomplish the tasks, duties and responsibilities listed in column 1 of table A-II/1; and
- .2 judging that evidence against the criteria specified in the standard.

17 The arrangements for evaluating competence should be designed to take account of different methods of assessment which can provide different types of evidence about candidates' competence, e.g.:

- .1 direct observation of work activities (including seagoing service);
- .2 skills/proficiency/competency tests;
- .3 projects and assignments;
- .4 evidence from previous experience; and
- .5 written, oral and computer-based questioning techniques.

18 One or more of the first four methods listed should almost invariably be used to provide evidence of ability, in addition to appropriate questioning techniques to provide evidence of supporting knowledge and understanding.

#### **Section B-II/2**

**Guidance regarding the certification of masters and chief officers on ships of 500 gross tonnage or more**

(See section B-II/1 for guidance.)

#### **Section B-II/3**

**Guidance regarding the certification of officers in charge of a navigational watch and of masters on ships of less than 500 gross tonnage**

(See section B-II/1 for guidance.)